

The years of highest and lowest mean temperatures for August are shown in Table I of the REVIEW for August, 1894. The mean temperature for the current month was the highest on record at: Port Angeles, 60.1; Carson City, 69.7; Baker City, 70.0; Roseburg, 70.4; Portland, Oreg., 71.1; Spokane, 72.2; Walla Walla, 76.8. It was the lowest on record at: Sioux City, 68.2.

The maximum and minimum temperatures of the current month are given in Table I. The highest maxima were: Yuma, 112; Phoenix, 110; Red Bluff, 109; Fresno, 108; Topeka and Shreveport, 105; Walla Walla and Palestine, 104; Sacramento and Fort Smith, 103. The lowest maxima were: Block Island and Nantucket, 77; Point Reyes Light, 71; San Francisco and Eureka, 70; Tatoosh Island, 68. The highest minima were: Phoenix and Corpus Christi, 73; Galveston, New Orleans, Key West, Jupiter, and Charleston, 71; Pensacola and Tampa, 70; Yuma and Mobile, 69. The lowest minima were: Winnemucca, 36; Carson City, 37; Havre, 38; Moorhead, 39; Williston, Huron, Marquette, and Northfield, 30.

The years of highest maximum and lowest minimum temperatures for August are given in the last four columns of Table I of the REVIEW for August, 1896. During the current month the maxima temperatures were equal to or above the highest on record at: Carson City, 95; Atlanta, 96; Pensacola, 97; New Orleans, 99; Mobile, 101; Palestine, 104. The minimum temperatures were not below previous records at any Weather Bureau station.

The greatest daily range of temperature and the data for computing the extreme and mean monthly ranges are given for each of the regular Weather Bureau stations in Table I. The largest values of the greatest daily ranges were: Winnemucca and Idaho Falls, 47; Sacramento, Carson City, and Pierre, 44. The smallest values were: Hatteras, 11; Corpus Christi, 14; Block Island, 15; Galveston, Jupiter, and Nantucket, 17.

Among the extreme monthly ranges the largest were: Winnemucca, 62; Havre, 59; Carson City, 58; Williston, 57. The smallest were: Corpus Christi, Hatteras, and Nantucket, 18; Key West and Block Island, 20; San Francisco, 21; Tatoosh Island, 22.

Accumulated monthly departures from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures are given in the third column, for comparison with the departures of current conditions of vegetation from the normal condition.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
New England .....	+ 3.8	+ 0.5	Florida Peninsula .....	0.0	0.0
Middle Atlantic .....	+ 0.9	+ 0.1	Southern Slope .....	0.0	0.0
South Atlantic .....	+ 1.3	+ 0.2			
East Gulf .....	+ 1.8	+ 0.2			
West Gulf .....	+ 6.9	+ 0.9	Ohio Valley and Tenn. ....	- 0.9	- 0.1
Lower Lake .....	+ 2.5	+ 0.3	North Dakota .....	- 5.8	- 0.7
Upper Lake .....	+ 8.9	+ 1.1	Northern Slope .....	- 2.1	- 0.3
Upper Mississippi Valley ..	+ 1.7	+ 0.2	Southern Plateau .....	- 6.4	- 0.8
Missouri Valley .....	+ 0.8	+ 0.1	Middle Plateau .....	- 5.8	- 0.7
Middle Slope .....	+ 3.0	+ 0.4	Middle Pacific .....	- 2.0	- 0.2
Northern Plateau .....	+ 8.2	+ 1.0	South Pacific .....	- 4.3	- 0.5
North Pacific .....	+ 1.2	+ 0.2			

#### MOISTURE.

The quantity of moisture in the atmosphere at any time may be expressed by the weight of the vapor coexisting with the air contained in a cubic foot of space, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-point for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, is given in Table I.

The rate of evaporation from a special surface of water on muslin at any moment determines the temperature of the wet-bulb thermometer. The mean wet-bulb temperature is now published in Table I; it is always intermediate, and generally about half way between the temperature of the air and of the dew-point. The quantity of water evaporated in a unit of time from the muslin surface may be considered as depending essentially upon the wet-bulb temperature, the dew-point, and the wind.

The relative humidity, or the ratio between the moisture that is present in the air and the moisture that it would contain if saturated at its observed temperature is given in Table I as deduced from the 8 a. m. and 8 p. m. observations. The general average for a whole day, or any other interval, would properly be obtained from the data given by an evaporimeter, but may also be obtained, approximately, from frequent observations of the relative humidity.

#### PRECIPITATION.

[In inches and hundredths.]

The distribution of precipitation for the current month, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III. The total precipitation for the current month was largest, exceeding 10 inches, in southern Mississippi, Alabama, and northwestern Florida. In general it was less than 4 inches; little or none fell at Rocky Mountain, Oregon, and California stations; regions of from 3 to 5 inches occurred in eastern Arizona and western Texas. The larger values for regular stations were: Mobile, 11.56; Tampa, 7.84; Charleston, 7.34; Narragansett Pier, 6.05; Jupiter, 6.85. In Canada, Bermuda, 7.40.

Details as to excessive precipitation are given in Tables XI and XII.

The diurnal variation, as shown by tables of hourly means of the total precipitation, deduced from the self-registering gauges kept at the regular stations of the Weather Bureau, is not now tabulated.

The current departures from the normal precipitation are given in Table I, which shows that precipitation was in excess in portions of Alabama, Georgia, South Carolina, eastern Tennessee, and southern Florida, but elsewhere generally deficient. The large excesses were: August, 5.2; Mobile, 4.7; Montgomery, 2.4; Fort Smith, 2.2. The large deficits were: Raleigh, 6.0; Kittyhawk, 5.5; Cape Henry and Wilmington, 4.0.

The average departure for each district is given in Table I. By dividing each current precipitation by its respective normal the following corresponding percentages are obtained (precipitation is in excess when the percentage of the normal exceeds 100):

Above the normal: Florida Peninsula, 111; East Gulf, 103; southern Plateau, 107; Northern Plateau, 131.

Normal: northern Slope, middle Pacific, and southern Pacific.

Below the normal: New England, 98; middle Atlantic, 63; south Atlantic, 77; west Gulf, 83; Ohio Valley and Tennessee, 64; lower Lake, 86; upper Lake, 83; North Dakota, 66; upper Mississippi, 57; Missouri Valley, 70; middle Slope, 92; southern Slope, 79; middle Plateau, 71; north Pacific, 90.

In Canada, Prof. R. F. Stupart says:

The rainfall was nearly average over the greater portion of the Dominion. The only districts in which there was any marked departure above were those lying north and west of Lake Superior and near the Georgian Bay, and the only marked deficiency occurred in the upper St. Lawrence Valley, where the amount was just about half the average.

The years of greatest and least precipitation for August are

given in the REVIEW for August, 1890. The precipitation for the current month was the greatest on record at: Augusta, 10.39; Narragansett Pier, 6.95. It was the least on record at: San Antonio, 0.40; Moorhead, 0.88; Indianapolis, 0.42; Kittyhawk, 1.33; Cape Henry, 1.53.

The total accumulated monthly departures from January 1 to the end of the current month are given in the second column of the following table; the third column gives the current accumulated precipitation expressed as a percentage of its normal value.

Districts.	Accumulated departures.	Accumulated precipitation.	Districts.	Accumulated departures.	Accumulated precipitation.
	Inches.	Per ct.		Inches.	Per ct.
New England .....	+ 1.70	106	Middle Atlantic .....	- 2.10	93
Florida Peninsula .....	+ 4.50	114	South Atlantic .....	- 3.30	91
Ohio Valley and Tenn. ....	+ 1.30	104	East Gulf .....	- 1.80	95
North Dakota .....	+ 0.10	101	West Gulf .....	- 6.40	78
Upper Mississippi Valley ..	+ 1.70	107	Lower Lake .....	- 1.10	95
Middle Slope .....	+ 0.70	104	Upper Lake .....	- 0.30	99
Southern Slope .....	+ 1.70	111	Missouri Valley .....	- 1.30	94
Southern Plateau .....	+ 2.80	149	Northern Slope .....	- 1.00	91
Middle Plateau .....	+ 0.10	101	North Pacific .....	- 1.60	95
Northern Plateau .....	+ 0.40	104	Middle Pacific .....	- 2.30	88
South Pacific .....	+ 0.80	110			

#### HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 30, 31. Arizona, 2, 6, 18, 19. Arkansas, 30. California, 20. Colorado, 1, 2, 3, 6, 14 to 17, 30. Connecticut, 15. Florida, 13. Georgia, 30. Idaho, 4. Illinois, 9. Indiana, 1, 14, 15, 19, 24. Iowa, 2, 3, 7, 20, 23, 25. Kentucky, 1, 2, 4, 6, 10, 15, 22, 23. Louisiana, 30. Maryland, 11, 14, 15, 16, 23, 24, 25. Massachusetts, 22. Michigan, 9, 10, 14, 15, 24, 28, 29. Minnesota, 2, 28, 31. Missouri, 3, 4, 19, 21, 25. Montana, 1, 5, 13, 31. Nebraska, 7, 13, 16, 17, 20. Nevada, 17, 26. New Jersey, 4, 16, 22, 23. New Mexico, 4, 6, 9, 10, 11, 16, 18, 19, 21. New York, 10, 12, 15, 17, 19. North Carolina, 5, 16, 20, 25, 31. North Dakota, 3, 18, 27, 28. Ohio, 4, 10, 15, 16, 29. Pennsylvania, 4, 10, 15, 18. South Carolina, 1, 6, 14, 29, 30, 31. South Dakota, 1, 31. Tennessee, 3, 22, 25, 30. Vermont, 9, 15, 16, 19. Virginia, 5, 10, 16, 23, 30. Washington, 4. West Virginia, 23. Wisconsin, 9. Wyoming, 2, 14, 17, 19, 30.

#### WIND.

The prevailing winds for August, 1897, viz, those that were recorded most frequently, are shown in Table I for the regular Weather Bureau stations.

Maximum wind velocities are given in Table I, which also gives the altitudes of the Weather Bureau anemometers above the ground. Maxima of 50 miles or more per hour were reported during this month at regular stations of the Weather Bureau as follows (maximum velocities are averages for five minutes; extreme velocities are gusts of shorter duration, and are not given in this table):

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Miles				Miles	
Chicago, Ill .....	1	55	ne.	Knoxville, Tenn .....	30	50	sw.
Duluth, Minn .....	8	50	nw.	Sault Ste. Marie, Mich.	23	50	nw.
Fort Canby, Wash .....	31	53	s.	Tatoosh, Wash .....	3	50	e.

The resultant winds, as deduced from the personal observations made at 8 a. m. and 8 p. m., are given in Table VIII. These latter resultants are also shown graphically on Chart IV, where the small figure attached to each arrow shows the

number of hours that this resultant prevailed, on the assumption that each of the morning and evening observations represents one hour's duration of a uniform wind of average velocity. These figures indicate the relative extent to which winds from different directions counterbalanced each other.

#### ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table IX, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 10th, 227, and 15th, 277.

Reports were most numerous from Colorado, 236; Florida, 238; Ohio, 274.

Thunderstorm days were most numerous in: Florida, 31; New Mexico, 29; Mississippi, 28; Colorado and Louisiana, 27.

In Canada.—Thunderstorms were reported as follows: St. Johns, 5, 6, 8, 9, 10, 14; Halifax, 6, 15, 25; Grand Manan, 16; Yarmouth, 11, 16; Charlottetown, 6, 9, 16; Chatham, 16, 20; Father Point, 15, 16; Quebec, 8, 10, 15, 16, 20, 27; Montreal, 8, 10, 16, 25; Rockcliffe, 9; Toronto, 10, 15, 18, 24, 30; White River, 15, 29; Port Stanley, 4, 10, 25, 29, 30; Saugeen, 10; Parry Sound, 10, 14, 18, 24; Port Arthur, 9, 13, 28; Winnipeg, 8, 12; Minnedosa, 12; Qu'Appelle, 3, 11, 21, 25; Medicine Hat, 7; Swift Current, 1, 5; Calgary, 9, 12; Banff, 7, 10, 11, 16, 21, 25; Prince Albert, 7, 12, 13, 15, 21; Edmonton, 5, 11, 12, 24; Battleford, 7, 10, 11, 12.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, from the 8th to the 16th, inclusive. On the remaining twenty-two days of this month 74 reports were received, or an average of about 3 per day. The dates on which the number of reports of auroras for the whole country especially exceeded this average were: 19th, 13; 20th, 7; 29th, 7.

Reports were most numerous from Minnesota, 9; North Dakota, 19; Ohio, 10; Wisconsin, 8.

The number of reports was a large percentage of the number of observers in: North Dakota, 40.

In Canada.—Auroras were reported as follows: Grand Manan, 20; Yarmouth, 31; Quebec, 20, 22, 28, 30; Montreal, 20, 23; White River, 29, 30; Winnipeg, 2, 15, 23, 26, 29, 30; Minnedosa, 1, 3, 26, 29, 30.

#### SUNSHINE AND CLOUDINESS.

The quantity of sunshine, and therefore of heat, received by the atmosphere as a whole is very nearly constant from year to year, but the proportion received by the surface of the earth depends upon the absorption by the atmosphere, and varies largely with the distribution of cloudiness. The sunshine is now recorded automatically at 22 regular stations of the Weather Bureau by its photographic, and at 40 by its thermal effects; at one of these stations records are kept by both methods. The photographic record sheets show the apparent solar time, but the thermometric records show seventy-fifth meridian time; for convenience the results are all given in Table X for each hour of local mean time. In order to complete the record of the duration of cloudiness these registers are supplemented by special personal observations of the state of the sky near the sun in the hours after sunrise and before sunset, and the cloudiness for these hours has been added as a correction to the instrumental records, whence there results a complete record of the duration of sunshine from sunrise to sunset.